

# Ground Processing Optimization Using Artificial Intelligence Techniques, Phase II

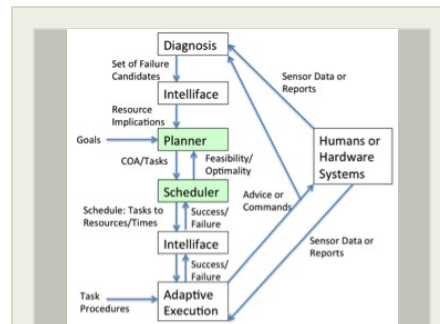
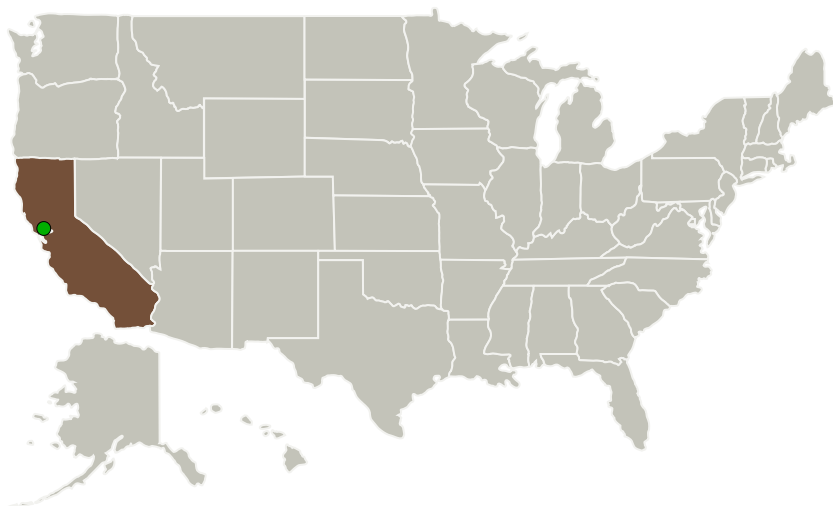
Completed Technology Project (2014 - 2016)



## Project Introduction

The ultimate goal is the automation of a large amount of KSC's planning, scheduling, and execution decision making. Phase II will result in a complete full-scale implementation of a general framework and its application to several problems at KSC to create several operational systems (e.g., for Ground Processing (GP) and the Cryogenic Test Bed (CTB)) and other systems targeting future, advanced applications (e.g., autonomous cryogenic operations). During Phase II, delivered applications will improve scheduling of SLS Processing and V&V activity, including reduced scheduler manpower, reduced turnaround time in response to changes and what-ifs, and more optimal schedules; improve CTB Planning and Scheduling; and complete the diagnosis, planning, scheduling, and execution closed loop system for more-automatic ground and autonomous space-based cryogenic operations. The KSC Engineering Development Lab has substantial development and testing efforts ongoing for automatically diagnosing faults in cryogenic operations. By interfacing our system to these applications, it effectively completes the closed loop system required for completely autonomous operations. Our Phase II system will participate in a number of demonstrations during Phase II to prove the capabilities for future advanced more-automatic ground and space-based operations. Letters of support are included in this proposal from the managers of the groups that would use the operational systems in Phase II and the manager of the project demonstrating future, advanced applications. This Phase II effort will also improve the ability of SMEs to customize intelligent scheduling systems, capture corporate knowledge, and implement the required interfaces to allow operational use and participation in cryogenic operations demonstrations.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Stottler Henke Associates, Inc.	Lead Organization	Industry	San Mateo, California
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

## Primary U.S. Work Locations

California

## Project Transitions

▶ **April 2014:** Project Start

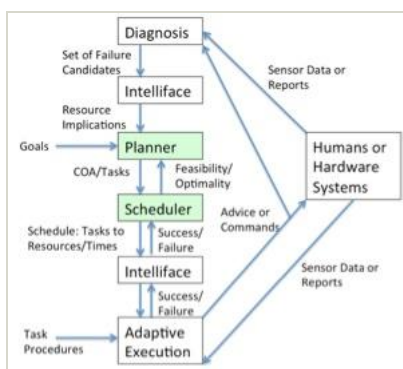
✓ **August 2016:** Closed out

**Closeout Summary:** Ground Processing Optimization Using Artificial Intelligence Techniques, Phase II Project Image

### Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137426>)

## Images



### Briefing Chart Image

Ground Processing Optimization Using Artificial Intelligence Techniques, Phase II

(<https://techport.nasa.gov/image/126066>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Stottler Henke Associates, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

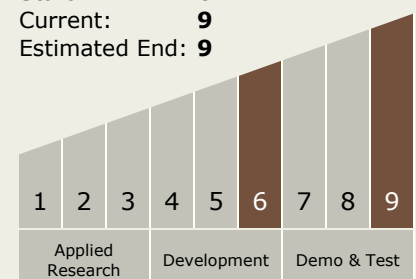
Carlos Torrez

### Principal Investigator:

Richard R Stottler

## Technology Maturity (TRL)

Start: 6  
Current: 9  
Estimated End: 9



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## Technology Areas

### Primary:

- TX13 Ground, Test, and Surface Systems
  - └ TX13.4 Mission Success Technologies
    - └ TX13.4.1 Mission Planning

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System